UNITED STATES PATENT AND TRADEMARK OFFICE

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10/662,258	09/15/2003	Shih-Zheng Kuo	9585-0280	9035

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/662,258	KUO, SHIH-ZHENG
	Examiner	Art Unit
	STEVEN KAU	2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *11 February 2010*.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-10,12-24 and 31* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-10,12-24 and 31* is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on *15 September 2003* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☒ All   b) ☐ Some * c) ☐ None of:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Reopen after Notice of Appeal

1.   In view of the Notice of Appeal filed on 02/11/2010, PROSECUTION IS HEREBY

REOPENED. A new ground of rejection is set forth below. To avoid abandonment of the

application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37

CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an

appeal brief under 37 CFR 41o37. The previously paid notice of appeal fee and appeal

brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37

CFR 41.20 have been increased since they were previously paid, then appellant must

pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved the reopening of prosecution by

signing this Action below.

Status of the Claims

2.   Claims 11 and 25-30 have been canceled. Claims 1-10, 12-24 and 31 remain

pending for examination in this Action.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1, 2, 10, 15, 18, 19, 20 and 24 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Liu (US 7,492,488) in view of Lee et al (US 6,178,015) and Su

(6,233,011).

Regarding claim 1.

Liu' 488 discloses a method performed by a scanner, comprising: scanning a

document (**referring to Figs. 1A ad 2A, Optical Chassis 12 of Fig. 1a or Optical**

Chassis 21 of Fig. 2A is driven to move along the holding board 10/20 for

scanning or capturing an object image, col 1, lines 22-41, and col 3, lines 55-64,

respectively); and compensating for image brightness in a scanned image of the

document (**i.e. light intensity compensation, such, "The image capturing element**

then uses the calibration parameter to perform calibration for setting the left and

right hand side margins, scanning starting position value and light intensity

compensation", col 1, lines 42-62).

Liu does not disclose determining a plurality of actual gray level values for a

plurality of pixels scanned from the document; scanning a continuous longitudinal

calibration pattern while scanning the document to determine a correctional gray level

value associated with the calibration pattern; determining a compensational gray level

value with respect to the actual gray level value for each of the pixels, wherein the

compensational gray level value is based at least in part on the correctional gray level

value and the actual gray level values for each of the pixels scanned from the

document; and compensating for image brightness in a scanned image of the document

using the compensational gray level value for each of the pixels.

In the same field of endeavor, Lee teaches scanning a document to determine a

plurality of actual gray level values for a plurality of pixels of scanned from the document

(Lee' 015 discloses a method to have an optical ruler located along the scanning

direction thus both document and the optical ruler are scanned and gray values

of both objects are obtained, Figs. 1-3 and col 2, lines 5-16 and lines 37-59 and col

4, lines 20-45); scanning a continuous longitudinal calibration pattern while scanning

the document to determine a correctional gray level value associated with the

calibration pattern **(i.e. gray level value is derived as the image sensor moves along**

the test black and white pattern as shown in Fig. 1, col 2, lines 1-16); and

In the same field of endeavor, Su' 011 teaches determining a compensational

gray level value with respect to the actual gray level value for each of the pixels **(i.e.**

compensational gray level value is calculated for the actual gray level value

obtained through image scanning, col 4, lines 34-67), wherein the compensational

gray level value is based at least in part on the correctional gray level **(i.e. correctional**

gray value is obtained through the method described in Fig. 4 and col 5, lines 21-

30) and the actual gray level values for each of the pixels scanned from the document

(**i.e. actual gray value is obtained through scanning, col 4, lines 34-51**); and

compensating for image brightness in a scanned image of the document using the

compensational gray level value for each of the pixels (**i.e. the white-value of each**

pixel is compensated, col 3, line 61 to col 5, line 30).

Having the method of Liu' 488 reference and then given the well-established

teaching of Lee' 015 and Su' 011 reference, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to modify the apparatus of

Liu' 488 reference to include the known technique of "determining a plurality of actual

gray level values for a plurality of pixels scanned from the document; scanning a

continuous longitudinal calibration pattern while scanning the document to determine a

correctional gray level value associated with the calibration pattern" taught by Lee' 015.

The motivation for doing so would have been to improve scanner calibration, i.e. the

actual moving distance of the optical sensor can be determined (col 2, lines 5-16, Lee'

015), and further, the technique provided could easily be established for one another

with predictable results. The to modify the combination of Liu and Lee to include another

known technique of "determining a compensational gray level value with respect to the

actual gray level value for each of the pixels, wherein the compensational gray level

value is based at least in part on the correctional gray level value and the actual gray

level values for each of the pixels scanned from the document; and compensating for

image brightness in a scanned image of the document using the compensational gray

level value for each of the pixels" taught by Su' 011 reference. The motivation for doing

so would have been to improve the quality of scanner calibration by providing gray-

scale compensation to the resolve white-level uniformity problem (col 1, lines 44-60, Su'

011), and further, the technique provided could easily be established for one another

with predictable results.

Regarding claim 2, in accordance with claim 1.

Liu discloses a top (**referring to the transparent board made of glass or

acrylic, is the top of the image scanning system of Figs. 1A and 2A, col 3, lines

43-63**); a scanning chassis configured to be movable under the top along a scanning

path (**referring to Figs. 1A ad 2A, Optical Chassis 12 of Fig. 1a or Optical Chassis

21 of Fig. 2A is driven to move along the holding board 10/20 for scanning or

capturing an object image, col 1, lines 22-41, and col 3, lines 55-64, respectively**);

and a scanning platform disposed at the top (**referring to the transparent board made

of glass or acrylic, is the top of the image scanning system of Figs. 1A and 2A,

col 3, lines 43-63**), wherein the scanning platform is configured to support the

document above the scanning chassis (**referring to Figs. 1A ad 2A, scanning object,

or a document is supported by the holding board, or the scanning platform, col 1,

lines 22-41, and col 3, lines 55-64, respectively**).

Liu does not disclose wherein the calibration pattern is positioned along a lateral

side of the scanning platform, and extends continuously along substantially an entire

length of the scanning path.

Lee teaches wherein the calibration pattern is positioned along a lateral side of

the scanning platform (**e.g. optical rulers is along the scanning platform, Fig. 1, col

1 line 66 to 2, line 16**), and extends continuously along substantially an entire length of

the scanning path (**e.g. referring to Fig. 1, the test pattern is extents along the scanning path in the surface side of top chassis, col 2, lines 37-58**).

Having the method of Liu' 488 reference and then given the well-established teaching of Lee' 015 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Liu' 488 reference to include the known technique of "the calibration pattern is positioned along a lateral side of the scanning platform, and extends continuously along substantially an entire length of the scanning path" taught by Lee' 015. The motivation for doing so would have been to improve scanner calibration quality, i.e. the actual moving distance of the optical sensor can be determined (col 2, lines 5-16, Lee' 015), and further, the technique provided could easily be established for one another with predictable results.

Regarding claim 10.

Liu discloses an apparatus comprises: a scanning element configured to be moveable in a document scanning direction (**referring to Figs. 1A ad 2A, Optical Chassis 12 of Fig. 1a or Optical Chassis 21 of Fig. 2A is driven to move along the holding board 10/20 for scanning or capturing an object image, col 1, lines 22-41, and col 3, lines 55-64, respectively**); a scanning platform (**i.e. transparent holding board**) configured to support a document (**referring to Fig. 2A, "The transparent holding board 20 is preferably made of glass or acrylic. The scanning object 23 is located above the holding board and the optical chassis 21 is located below the holding board 20 for reading the image data of the scanning object 23", col 3, lines 43-63**); and a processor (**referring to Fig. 2B, 3, and 4, steps of using the**

calibration parameter to perform compensation and calibration for the captured

image, must be processed and controlled by a processor. i.e. as stated in col 6,

line 48 to col 7, line 37).

Liu does not disclose a reference pattern disposed adjacent to the scanning

platform, wherein the reference pattern is at least as long as the scanning platform in

the document scanning direction; determine actual gray level values for pixels of a

scanned image of the document; determine a correctional gray level value based at

least in part on a scanned image of the reference pattern; determine a compensational

gray level value for the pixels of the scanned image based at least in part on the actual

gray level and the correctional gray level: and compensate the scanned image using the

compensational gray level value.

In the same field of endeavor, Lee teaches a reference pattern disposed adjacent

to the scanning platform, where the reference pattern is at least as long as the scanning

platform in the document scanning direction **(referring to Fig. 1, a reference pattern**

103 is disposed along the scanner platform in the direction of document

scanning); and

In the same field of endeavor, Su teaches determining a correctional gray level

value based at least in part on a scanned image of the reference pattern (**i.e.**

compensational gray level value is calculated for the actual gray level value

obtained through image scanning, col 4, lines 34-67); determine a compensational

gray level value for the pixels of the scanned image based at least in part on the actual

gray level and the correctional gray level (**i.e. compensational gray level value is**

calculated for the actual gray level value obtained through image scanning, col 4,

lines 34-67); and compensate the scanned image using the compensational gray level

value (**i.e. compensated gray-scale value is obtained, col 4, lines 53-65**).

Having an apparatus of Liu' 488 reference and then given the well-established

teaching of Lee' 015 and Su' 011 reference, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to modify the apparatus of

Liu' 488 reference to include the known technique of "a reference pattern disposed

adjacent to the scanning platform, wherein the reference pattern is at least as long as

the scanning platform in the document scanning direction" taught by Lee' 015. The

motivation for doing so would have been to improve scanner calibration quality, i.e. the

actual moving distance of the optical sensor can be determined (col 2, lines 5-16, Lee'

015), and further, the technique provided could easily be established for one another

with predictable results. The to modify the combination of Liu and Lee to include another

known technique of "determine a correctional gray level value based at least in part on a

scanned image of the reference pattern; determine a compensational gray level value

for the pixels of the scanned image based at least in part on the actual gray level and

the correctional gray level; and compensate the scanned image using the

compensational gray level value" taught by Su' 011 reference. The motivation for doing

so would have been to improve the quality of scanner calibration by providing gray-

scale compensation to the resolve white-level uniformity problem (col 1, lines 44-60, Su'

011), and further, the technique provided could easily be established for one another

with predictable results.

Regarding claim 15, in accordance with claim 10.

Liu does not disclose wherein the scanning element is configured to scan both the reference pattern and the document at the same time.

However, Lee discloses wherein the scanning element is configured to scan both the reference pattern and the document at the same time (**referring to Fig. 1, both the reference pattern and the document are scanned in the same time, col 4, lines 20-45**).

Having an apparatus of Liu' 488 reference and then given the well-established teaching of Lee' 015 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Liu' 488 reference to include the known technique of "the scanning element is configured to scan both the reference pattern and the document at the same time" taught by Lee' 015. The motivation for doing so would have been to improve scanner calibration, i.e. the actual moving distance of the optical sensor can be determined (col 2, lines 5-16, Lee' 015), and further, the technique provided could easily be established for one another with predictable results.

Regarding claim 18, in accordance with claim 10.

Liu does not disclose wherein a length of the reference pattern is parallel to the scanning direction and equal to or greater than a length of the scanning platform.

However, Lee' 015 teaches wherein a length of the reference pattern is parallel to the scanning direction and equal to or greater than a length of the scanning platform (Fig. 1, col 2, lines 37-58).

Having an apparatus of Liu' 488 reference and then given the well-established teaching of Lee' 015 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Liu' 488 reference to include the known technique of "a length of the reference pattern is parallel to the scanning direction and equal to or greater than a length of the scanning platform" taught by Lee' 015. The motivation for doing so would have been to improve scanner calibration quality, i.e. the actual moving distance of the optical sensor can be determined (col 2, lines 5-16, Lee' 015), and further, the technique provided could easily be established for one another with predictable results.

Regarding claim 19.

Applicant is intended to activate 35 USC 112, 6th paragraph by using "means for" phrase. However, the examiner does not considered claim 19 meets the 3-prong requirements, i.e. (a) the claim limitation must use the phrase "means for" or "step for": (b) the "means for" or "step for" must be modified by functional language; and (c) the phrase "means for" or "step for" must not be modified by sufficient structure, material, or acts for achieving the specified function.

Claim 19 is directed to an apparatus claim which substantially corresponds to operation of the device in claim 10. Thus, claim 19 is rejected as set forth above for claim 10.

Regarding claim 20, in accordance with claim 19.

Regarding **claim 20**, the structure elements of apparatus claim 18 perform all steps of apparatus claim 20. Thus claim 20 is rejected under 103(a) for the same reason discussed in the rejection of claim 18.

Regarding claim 24, in accordance with claim 19.

Regarding **claim 24**, the structure elements of apparatus claim 15 perform all steps of apparatus claim 24. Thus claim 24 is rejected under 103(a) for the same reason discussed in the rejection of claim 15.

5.   Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (7,492,488) in view of Lee et al (US 6,178,015) (Lee' 015) and Su (6,233,011) as applied to claim 1 above, and further in view of Selby (US, 5,404,232) and Horiuchi et al (US 6,445,469).

Regarding claim 3, in accordance with claim 1.

Liu does not scanning a second continuous longitudinal calibration pattern while scanning the document to determine a second correctional gray level associated with the calibration pattern, wherein the first correctional gray level is for black, wherein the second correctional gray level is for white, and wherein determining the compensational gray level value for each of the pixels comprises: calculating [(each of the actual gray level values with respect to each of the pixels - the correctional gray level value for black) + (the correctional gray level value for white - the correctional gray level value for black) * (a theoretical gray level value for white - a theoretical gray level value for black)].

Lee discloses scanning a continuous longitudinal calibration pattern while scanning the document to determine a correctional gray level associated with the calibration pattern (**Lee' 015 discloses a method to have an optical ruler located along the scanning direction thus both document and the optical ruler are scanned and gray values of both objects are obtained, Figs. 1-3 and col 2, lines 5-16 and lines 37-59 and col 4, lines 20-45**), wherein the first correctional gray level is for black, wherein the second correctional gray level is for white (**referring to Fig. 1, where black and white patterns are shown and corresponding gray values are shown in Fig. 3**).

Selby teaches a second continuous longitudinal calibration pattern, wherein the first correctional gray level is for black, wherein the second correctional gray level is for white (**referring to Figs. 2 and 5, where white test strip 30 and black test strip 32 are shown and corresponding gray value for black and white are determined, col 4, lines 37-66**).

Horiuchi' 469 discloses calculating [(each of the actual gray level values with respect to each of the pixels - the correctional gray level value for black) ÷ (the correctional gray level value for complete white - the correctional gray level value for black) * (a theoretical gray level value for complete white - a theoretical gray level value for black)] (**Horiuchi teaches and suggests embodiments, e.g. First, Third to Eleventh, for using equations, col 9, lines 50-60, and subroutines A1, A2 and A3 for determining compensational gray level, Figs. 9, 16, 25, 26, 27 and 28, cols 9 through 12**).

Having a method of Liu' 488 reference and then given the well-established

teaching of Lee' 015, Selby' 232 and Horiuchi' 469 reference, it would have been

obvious to one having ordinary skill in the art at the time the invention was made to

modify the method of Liu' 488 reference to include "scanning a continuous longitudinal

calibration pattern while scanning the document to determine a correctional gray level

associated with the calibration pattern" taught by Lee since doing so would have been

to improve the scanner calibration quality with a predictable result. And then to modify

the combination of Liu and Lee to include "a second continuous longitudinal calibration

pattern, wherein the first correctional gray level is for black, wherein the second

correctional gray level is for white" taught by Selby, since doing so would have improved

the method of Lee to allow the system for adjusting the gain level and the offset level

(col 4, lines 9-14, Selby); and then would have modify the combination of Liu, Lee, Su

and Selby to include calculating [(each of the actual gray level values with respect to

each of the pixels - the correctional gray level value for complete black) ÷ (the

correctional gray level value for complete white - the correctional gray level value for

complete black) * (a theoretical gray level value for complete white - a theoretical gray

level value for complete black)] as taught by Horiuchi' 469 reference since doing so

would increase the versatility of the method of Lee' 015 and further the calculation

provided could easily be established for one another with predictable results.

6.   Claims 12, 13, 14, 16, 17, 21, 22 and 23 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Liu (US 7,492,488) in view of Lee et al (US 6,178,015) and Su

(6,233,011) as applied to claims 10 and 20 above, and further in view of Selby (US

5,404,232) and of Chien (6,480,306)

Regarding claim 12, in accordance with claim 10.

Liu does not disclose wherein the reference pattern comprises a continuous

black pattern elongated in a direction parallel with the document scanning direction and

a continuous white pattern elongated in a direction parallel with the document scanning

direction and positioned adjacent to the continuous black pattern, and wherein the

processor is further configured to determine a black correctional gray level value from

the continuous black pattern and determine a white correctional gray level value from

the continuous white pattern.

However, Lee discloses wherein the reference pattern comprises a continuous

pattern elongated in a direction parallel with the document scanning direction and a

continuous white pattern elongated in a direction parallel with the document scanning

direction and positioned adjacent to the continuous pattern (**i.e. referring to Fig. 1,**

which shows a continuous pattern parallel with document scanning direction);

Selby teaches a continuous black pattern (**referring to Figs. 2 and 5, which**

show a continuous black pattern); and

Chien teaches wherein the processor (**i.e. processing unit 36 of Fig. 4**) is

further configured to determine a black correctional gray level value from the continuous

black pattern and determine a white correctional gray level value from the continuous

white pattern (**i.e. black or dark and white correctional gray level values are**

determined, col 4, lines 34-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Liu' 488 to include "the reference pattern comprises a continuous pattern elongated in a direction parallel with the document scanning direction and a continuous white pattern elongated in a direction parallel with the document scanning direction and positioned adjacent to the continuous pattern" taught by Lee' 015 since doing so would have been to improve the scanner calibration quality with a predictable result. Then to modify the combination of Liu and Lee include a continuous black pattern taught by Selby' 232 to improve the system gain and offset of scanner with a predictable result; and then to modify the combination of Liu's to include the processor is further configured to determine a black correctional gray level value from the continuous black pattern and determine a white correctional gray level value from the continuous white pattern as taught by Chien' 306 since doing so would improve the gray level value compensation and therefore to improve image quality with a predictable result.

Regarding claim 13, in accordance with claim 12.

Liu does not disclose wherein the processor is further configured to determine the compensational gray level value based at least in part on the black correctional gray level value, the white correctional gray level value, a theoretical gray level value for black, a theoretical gray level value for white, and the actual gray level values.

However, Chien teaches wherein the processor is further configured to determine the compensational gray level value based at least in part on the black correctional gray level value (**i.e. corresponding gray level value of the scanned objected is**

compensated with a correction value, col 1, lines 35-59), the white correctional gray

level value (**i.e. corresponding gray level value of the scanned objected is**

compensated with a correction value col 1, lines 35-59), a theoretical gray level

value for black (**i.e. corresponding gray level value of the scanned objected is**

compensated with a correction value with theoretical value, i.e. dark corrective

element is defined as "0", col 1, lines 35-59), a theoretical gray level value for

complete white and the actual gray level values (**i.e. the actual gray value before**

compensation of the scanned object is X, Fig. 2, col 1, line 64 to col 2, line 14 and

corresponding gray level value of the scanned objected is compensated with a

correction value with theoretical value, i.e. white corrective element is defined as

"255", col 1, lines 35-59).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention to have modified Liu' 488 to include "the processor is further

configured to determine the compensational gray level value based at least in part on

the black correctional gray level value, the white correctional gray level value, a

theoretical gray level value for black, a theoretical gray level value for complete white,

and the actual gray level values" as taught by Chien' 306 to improve the accuracy of

image scanning to compensate the possible distortion of a reproduced image due to

fluctuation of the scanning speed without a considerable increase of the manufacturing

cost of the image reading device.

Regarding claim 14, in accordance with claim 10.

Liu does not disclose wherein the reference pattern comprises a continuous black pattern, and wherein the processor is further configured to determine a black correctional gray level value from the continuous black pattern.

However, Selby teaches a continuous black pattern (**i.e. referring to Figs. 2 and 5, where continuous black and white patterns are disclosed**); and

Chien wherein the processor is further configured to determine a black correctional gray level value from the continuous black pattern (**i.e. dark or black corrective element is defined as "0" and the corresponding black correction value is determined, col 1, lines 35-59**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Liu' 488 to include a continuous black pattern as taught by Selby' 232 since doing so would enhance the apparatus of Lee' 105 to provide gray level measurement of black reference pattern for scanner calibration with predictable result; then to modify the combination of Lee's to include the processor is further configured to determine a black correctional gray level value from the continuous black pattern as taught by Chien' 306 to improve the functionality of the scanner with a predictable result.

Regarding claim 16, in accordance with claim 10.

The structure elements of apparatus claim 16 perform all steps of apparatus claim 14. Thus claim 16 is rejected under 103(a) for the same reason discussed in the rejection of claim 14.

Regarding claim 17, in accordance with claim 16.

Liu does not disclose wherein the processor is further configured to determine the compensational gray level value based at least in part on the white correctional gray level value, a theoretical gray level value for white, and the actual gray level values.

However, Chien' 306 discloses wherein the processor is further configured to determine the compensational gray level value based at least in part on the white correctional gray level value (**e.g. determining for white or black correction level, col 1, lines 35-59 and col 4, lines 34-65**), a theoretical gray level value for white (**i.e. a theoretical value of white is defined "255"**), and the actual gray level values (**i.e. the compensational gray value is determined based on the defined correctional value and the scanned value, col 4, line 34 to col 5, line 50**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Liu' 488 to include wherein the processor is further configured to determine the compensational gray level value based at least in part on the white correctional gray level value, a theoretical gray level value for white, and the actual gray level values as taught by Chien' 469 to improve the accuracy of image scanning to compensate the possible distortion of a reproduced image due to fluctuation of the scanning speed without a considerable increase of the manufacturing cost of the image reading device.

Regarding claim 21, in accordance with claim 20.

Regarding claim 21, the structure elements of apparatus claim 12 perform all steps of apparatus claim 21. Thus claim 21 is rejected under 103(a) for the same reason discussed in the rejection of claim 12.

Regarding claim 22, in accordance with claim 20.

Regarding claim 22, the structure elements of apparatus claim 14 perform all steps of apparatus claim 22. Thus claim 22 is rejected <u>under 103(a)</u> for the same reason discussed in the rejection of claim 14.

Regarding claim 23, in accordance with claim 20.

Regarding claim 23, the structure elements of apparatus claim 16 perform all steps of apparatus claim 23. Thus claim 23 is rejected <u>under 103(a)</u> for the same reason discussed in the rejection of claim 16.

7.   Claims 4, 5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (US 7,492,488) in view of Lee et al (US 6,178,015), Selby (US 5,404,232) and Chien (6,480,306).

Regarding claim 4.

Liu' 488 disclose a method performed by a scanner, comprising: scanning a document (**referring to Figs 1A and 2A, a scanning object, i.e. a document is placed on the holding board for scanning, col 1, lines 22-41 and col 3, lines 43-63**); and compensating a scanned image of the document (**referring to Figs. 2-4, steps of processing for document image compensation, col 4, lines 24-59 and so on**).

Liu does not disclose scanning a document and a continuous longitudinal pattern, at the same time; determining a plurality of actual gray level values for a plurality of pixels scanned from the document; determining a correctional gray level value for white based at least in part on the longitudinal white pattern; determining a

compensational gray level value with respect to the actual gray level values for each of

the pixels based at least in part on the correctional gray level value for white, a

theoretical gray level value for white, and the actual gray level values for each of the

pixels; and compensating a scanned image of the document using the compensational

gray level value for each of the pixels

However, Lee teaches scanning a document and a continuous longitudinal

pattern, at the same time (**Lee' 015 discloses a method to have an optical ruler**

located along the scanning direction thus both document and the optical ruler are

scanned and gray values of both objects are obtained, Figs. 1-3 and col 2, lines 5-

16 and lines 37-59 and col 4, lines 20-45); determining a plurality of actual gray level

values for a plurality of pixels scanned from the document (**i.e. number of black and**

white pixels and their position are derived from the gray levels which are

determined from a center of a white pixel and to a center of black pixel, col 4,

lines 40-45 and Fig. 3); and

Selby teaches a longitudinal white pattern (**Referring to Figs. 2 and 5, Selby**

discloses a longitudinal White Test Strip 30, col 4, lines 25-36); and

Chien teaches determining a correctional gray level value for white based at least

in part on the white pattern (**i.e. referring to Figs. 1 and 2, the corresponding gray**

level x of the scanned object can be determined, col 1, lines 35-59, and col 4, line

45 to col 5, line 55); determining a compensational gray level value with respect to the

actual gray level values for each of the pixels based at least in part on the correctional

gray level value for white, a theoretical gray level value for white, and the actual gray

level values for each of the pixels (**i.e. the compensational gray level value with respect to the actual or scanned gray value is then calculated as shown in col 5, lines 40-50**); and compensating a scanned image of the document using the compensational gray level value for each of the pixels (**i.e. the compensational gray level value with respect to the actual or scanned gray value is then calculated as shown in col 5, lines 40-50 is applied to all pixels, col 4, line 67 to col 5, line 50**).

Having a method of Liu' 488 reference and then given the well-established teaching of Lee, Selby and Chien reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Liu reference to include "scanning a document and a continuous longitudinal pattern, at the same time, and determining a plurality of actual gray level values for a plurality of pixels scanned from the document" taught by Lee, since doing so would have been to improve the scanner calibration quality with a predictable result. Then to modify the combination of Liu and Lee to include "a longitudinal white pattern" as taught by Selby, since doing so would have improved the method of Liu to allow the system for adjusting the gain level and the offset level (col 4, lines 9-14, Selby); and then would have modify the combination of Liu's to include determining a compensational gray level value with respect to the actual gray level values for each of the pixels based at least in part on the correctional gray level value for white, a theoretical gray level value for white, and the actual gray level values for each of the pixels; and compensating a scanned image of the document using the compensational gray level value for each of the pixels as taught by Chien' 306 reference since doing so would increase the versatility of the method of

Liu and further the calculation provided could easily be established for one another with predictable results.

Regarding claim 5, in accordance with claim 4.

Claim 5 recites identical features as claim 2. Thus, arguments similar to that presented above for claim 2 are also equally applicable to claim 5.

Regarding claim 7.

Claim 7 is directed to a method claim which substantially corresponds to the steps of the method in claim 4. Thus, claim 7 is rejected as set forth above for claim 4.

Regarding claim 8, in accordance with claim 7.

The structure elements of method claim 5 perform all steps of method claim 8. Thus claim 8 is rejected under 103(a) for the same reason discussed in the rejection of claim 5.

8.   Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (US 7,492,488) in view of Liu (US 7,492,488) in view of Lee et al (US 6,178,015) (Lee' 015), Selby (US 5,404,232) and Chien (6,480,306) as applied to claim 4 above, and further in view of Su (US 6,233,011)

Regarding claim 31, in accordance with claim 4.

Liu does not disclose wherein the correctional gray level value for white is determined at the same time as at least one of the plurality of actual gray level values.

Su teaches wherein the correctional gray level value for white is determined at the same time as at least one of the plurality of actual gray level values (**referring to**

Figure 5, a process of correcting gray level for white based on the original gray value, col 3, line 61 to col 4, line 51).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the combination of Liu, Lee, Selby, and Chien to include wherein the correctional gray level value for white is determined at the same time as at least one of the plurality of actual gray level values as taught by Su' 011 since doing so would improve to resolve the white level uniformity and therefore to improve image quality with a predictable result.

9. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (US 7,492,488) in view of Lee et al (US 6,178,015) (Lee' 015), Selby (US 5,404,232) and Chien (6,480,306) as applied to claims 5 and 7 above, and further in view of Horiuchi et al (US 6,445,469).

Regarding claim 6, in accordance with claim 5.

Liu does not disclose calculating [each of the actual gray level values with respect to each of the pixels * (the theoretical gray level value for white + the correctional gray level value for white)].

Horiuchi' 469 discloses calculating [(each of the actual gray level values with respect to each of the pixels - the correctional gray level value for black) ÷ (the correctional gray level value for complete white - the correctional gray level value for black) * (a theoretical gray level value for complete white - a theoretical gray level value for black)] (**Horiuchi teaches and suggests embodiments, e.g. First, Third to**

Eleventh, for using equations, col 9, lines 50-60, and subroutines A1, A2 and A3

for determining compensational gray level, Figs. 9, 16, 25, 26, 27 and 28, cols 9

through 12).

Having a method of Liu' 488 reference and then given the well-established

teaching of Selby' 232 reference, it would have been obvious to one having ordinary

skill in the art at the time the invention was made to modify the method of Liu' 488

reference to include "calculating [(each of the actual gray level values with respect to

each of the pixels - the correctional gray level value for complete black) ÷ (the

correctional gray level value for complete white - the correctional gray level value for

complete black) * (a theoretical gray level value for complete white - a theoretical gray

level value for complete black)]" as taught by Horiuchi' 469 reference since doing so

would increase the versatility of the method of Liu and further the calculation provided

could easily be established for one another with predictable results.

Regarding claim 9, in accordance with claim 7.

Regarding claim 9, the structure elements of method claim 6 perform all steps of

method claim 9. Thus claim 9 is rejected under 103(a) for the same reason discussed in

the rejection of claim 6.

CONTACT INFORMATION

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Steven Kau whose telephone number is 571-270-1120

and fax number is 571-270-2120. The examiner can normally be reached on M-F, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Steven Kau/
Examiner, Art Unit 2625
April 25, 2010

/David K Moore/
Supervisory Patent Examiner, Art Unit 2625